

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

10/511094

REC'D 17 JUN 2004

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Applicant's or agent's file reference 63442-082	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/1 1501	International filing date (day/month/year) 15.04.2003	Priority date (day/month/year) 15.04.2002
International Patent Classification (IPC) or both national classification and IPC C08L81/06, C08L81/06		
Applicant SOLVAY ADVANCED POLYMERS, LLC et al		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 8 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

- This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☒ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 07.11.2003	Date of completion of this report 16.06.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Russell, G Telephone No. +49 89 2399-8738 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/11501

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-38 as originally filed

Claims, Numbers

1-27 as originally filed

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 - ☐ the language of publication of the international application (under Rule 48.3(b)).
 - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority in written form.
 - ☐ furnished subsequently to this Authority in computer readable form.
 - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
 - ☐ the claims, Nos.:
 - ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/11501

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 5-27 (partially)

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 5-27 (partially)

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

☐ restricted the claims.

☐ paid additional fees.

☐ paid additional fees under protest.

☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

☐ complied with.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/11501**

☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

☐ all parts.

☒ the parts relating to claims Nos. 1-4,5-27 (partially) .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-4
	No: Claims	5-27
Inventive step (IS)	Yes: Claims	
	No: Claims	1-27
Industrial applicability (IA)	Yes: Claims	1-27
	No: Claims	

2. Citations and explanations

see separate sheet

Paragraph III:

1. Claims 5 to 27 were only searched partially (see form PCT/ISA/210). The reasoning is as follows:

- 1.1 Claims 5 to 22 relate to products defined by reference to desirable characteristics or properties, namely light transmittance, yellowness index, or color factor (claims 5-16), yellowness index alone (claims 17-19, 23-25, 26), and color factor alone (claims 20-25, 27).

These said claims cover all products having these properties, whereas the application provides support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT for only a very limited number of such products. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the products by reference to a result to be achieved, so-called *desideratum* claims. There are no essential technical features present in said claims to allow the skilled person to attain said desired results, with the result that the claims only amount to claiming the underlying technical problem of the specification. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

According to the teaching of the application, these desired parameters/results are achieved by polysulfone compositions comprising essentially an organic phosphorus compound and one of an organic brightener and a blue to violet dye (see Examples; claims 1, 2).

- 1.2 Furthermore, current claims 5 to 22 relate to a products defined (inter alia) by reference to the following parameters:

P1: total luminous light transmittance (ASTM D-1003) of a 0.1 inch thick sample

P2: yellowness index (ASTM D-1925) on a 0.1 inch thick sample

P3: color factor defined by a particular formula.

The use of these parameters in the present context is considered to lead to a lack of clarity within the meaning of Article 6 PCT. While said parameters can be determined adequately by procedures and ASTM methods provided in the application, in general parameters are only allowed to define a product when the product cannot be defined adequately in another way (EPO Guidelines C-III, 4.7a; C-IV, 7.5). In this case, it seems possible to more adequately define the claimed

products by reference to the composition from which they are prepared.

The color factor P3 appears to be a non-state of the art parameter used by only a small number of manufacturers, meaning that its non-disclosure in most documents is not surprising.

Additionally, parameters refer to values at a particular thickness which may not be explicitly disclosed for such polysulfone compositions in the prior art. Prior disclosures may not even disclose such parameters. Hence, it is impossible to compare the parameters the applicant has chosen to employ with what is set out in the prior art (EPO Guidelines C-IV 7.5). The use of such parameters is seen as being an attempt to disguise novelty.

It is also noted that claims 17, 20, 26, and 27 do not contain any information concerning the thickness of the sample on which such measurements (see in this respect Tables 13 & 16; pg. 22), such that said claims are unclear.

Consequently, the search was carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the polysulfone compositions/products comprising polysulfone resin, an organic phosphorus compound, and one of an organic optical brightener and a blue to violet dye.

In accordance with Rule 66.1(e) PCT matter not searched is not part of the preliminary examination.

Paragraph IV:

1. Non-unity

Even if said claims were clear, then a problem of non-unity nonetheless exists.

The common concept between the independent claims 1, 5, 11, 17, 20, 26 and 27 appears to be the presence of a polysulfone. Claim 1 is not restricted by having to be transparent or having particular YI or color factors, the same being true for claim 11. In addition, the composition of claim 1 may contain a dye to affect these parameters, i.e., it is not clear how such low YI and CF and high transmittance can be achieved in a dyed composition.

Polysulfones are well known, thus not novel and lacking in inventive character, such that no common inventive concept exists between the seven separate inventions represented by the independent claims. Hence, the current specification does not fulfill the requirements of unity (Rule 13.1, 13.2 PCT).

Paragraph V:

Novelty and inventive step (Articles 33(2) and 33(3) PCT)

1. Claims 5, 11, 17, 20, 26, and 27 amount to claiming polysulfone polymer in the form of a composition, a moulded article, and a layer described in terms of the transparency, YI, and color factor.

The onus is on the applicant to demonstrate by comparative data or make plausible that the claimed polysulfones differ from those known in the art (EPO Guidelines C-IV, 7.5).

2. D1 (JP-A-11035705) describes a polyethersulfone resin optical film improved in color tone, especially in the degree of yellowing, high in transmittance by adding 50-200 ppm hypophosphorous acid and/or phosphorous acid to a polyether sulphone solution for forming said film. Example 1 (Table 1) has a YI of less than 1.00.

D2 (US-A-3 755 256) discloses a thermoplastic aromatic polysulfone composition of improved heat stability for moulded articles comprising 96-99.99 wt.-% of aromatic polysulfone and 4-0.01 wt.-% of a phosphorous compound (claims). Dyes may also be added (col. 2, l 43).

D4 (US-A-2001 0053805) describes a method of stabilizing thermoplastic resins including polyether sulfones and resulting composition by adding phosphorus containing compounds (claims 1, 6, 12, 17). Optical brighteners are mentioned as an option ([0066]). Very low yellowness values are obtained for polyolefins on addition of the phosphorus compounds, this teaching also extending to polyether sulfones.

D5 (US-A-2002 0010307) relates to a method for producing low color poly(aryl ether sulfone resin, in particular, poly(biphenyl ether sulfones), used for molded or extruded articles where a yellow color is unacceptable such as in optical lenses. Solution colour factor of 5 to 40 are obtained (Examples; claims 8, 9, 18). Desired products are preferably "water white" ([0015]), implying a high transmittance and low YI, and said improved resins may be readily dyed or pigmented ([0018]).

D6 (US-A-4 409 351) claims a composition comprising a thermoplastic resin including polysulphone and polyethersulphone in combination with an effective amount of a C14-36 fatty acid as mould release agent from injection moulds (claims 1, 2). Low values of YI, %transparency and haze are obtained for

polycarbonate and PETS, and similarly for polysulphone and polyethersulphone resins (Example 5).

3. Thus, notwithstanding the above objections under III and IV, the subject-matter of claims 5 to 27 (partially) is not considered to be novel or inventive.
4. The use of optical brighteners (D3 US-A-5438086; D4) and dyes (D2; D5) in polysulfone compositions is known in the art, such that nothing inventive can be seen in using these materials to mask unwanted yellowness.
As a result, an inventive step cannot be acknowledged for claims 1 to 4.